

Executive Summary
An Analysis of the Spring 2016 ACT Scores
of Utah's 11th Grade Students

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**UTAH STATE BOARD
OF EDUCATION**

Purpose

The purpose of the forthcoming full report is to provide analyses of the ACT scores of Utah's 11th grade students who took the ACT in spring 2016. The ACT testing corporation reports on all test scores for graduating students, therefore, this report provides valuable information of the results the Utah spring of 2016 administration only. Results presented will include mean scores by subject area, the percentage of students meeting college ready benchmarks by subject area, and the percentage of students scoring at each quartile based on national results. Results will be disaggregated by 1) student characteristics (race/ethnicity, eligibility for free or reduced lunch, gender, disability, English language proficiency, identification as gifted, and senior year GPA; 2) school type (Title I, charter and school accountability grade); and 3) district. Results also will be disaggregated by student information collected by ACT at the time of the test administration that includes self-reported grades, major, college location preference, courses taken, parent income and education level, financial aid expectations, student educational aspirations, and course-taking patterns. Multivariate analyses will be included to ascertain the cumulative effect of student characteristics on ACT Composite Scores. Next, ACT results will be correlated with SAGE scores. Finally, while national data will be presented throughout this report, comparisons to Utah scores should be interpreted with important differences in the samples tested kept in mind. In this report, ACT scores are not super scored.

American College Testing (ACT)

The ACT is a standardized test used to assess college readiness and high school achievement. To differing degrees across postsecondary institutions, it is used along with such factors as GPA, extracurricular activities, class rank, and letters of recommendation to make college admission and merit scholarship decisions. The ACT includes required sections on English, Math, Reading, and Science and an optional Writing section.

The English section includes 75 multiple choice questions primarily on usage and mechanics, which students have 45 minutes to complete. The Math section must be completed within 60 minutes and is comprised of 60 multiple choice questions on pre-algebra, algebra, geometry, and trigonometry. The Reading section lasts 45 minutes. Participants answer 40 multiple choice questions which assess comprehension of 4 reading passages. The Science section includes 40 questions requiring reasoning, interpretation, problem solving, or evaluation. The section must be completed in 35 minutes. The optional Writing section requires students to write an essay in response to a prompt. Writing scores range from 1 to 12. Scores on the four required subjects range from 1 to 36. A Composite score is calculated by summing the scores from the 4 required subjects and dividing by 4. In 2014, 1,845,787 students took the ACT. Their mean Composite score was 21.0. Norms for the ACT were established using a sample of 5,860,565 students who graduated between 2014 and 2016. "The number of ACT-tested graduates increased by 8.6% compared to last year, rising from 1,924,436 graduates in 2015 to 2,090,342 graduates in 2016. Nearly two-thirds (64%) of all 2016 US high school graduates took the ACT, up from 59% last

year and from 40% in 2006.” Nationally, mean Composite ACT scores and the percentage of college ready students dropped this year, likely due to the increase in the percentage of all students tested. During the 2016-17 testing year, the national mean scores and standard deviations were as follows.

Table 1:
Mean National ACT Scores (2014-2016)

	English	Math	Reading	Science	Composite
Mean	20.3	20.8	21.3	20.8	20.9
SD	6.7	5.4	6.4	5.5	5.5

Sample

The sample included in this report is comprised of all 11th grade Utah public school students who were administered the ACT during the spring 2016 semester.

Preliminary Results

Mean ACT Scores

Table Two:
Mean ACT Scores: All 11th Grade Test Takers

	N	Descriptive Statistics		
		Utah Mean	National Mean	Std. Deviation
ACT Composite Score Spring 2016	39288	19.80	20.9	5.005
ACT English Score Spring 2016	39342	18.82	20.3	6.244
ACT Math Score Spring 2016	39327	19.57	20.8	4.870
ACT Reading Score Spring 2016	39302	20.17	21.3	6.110
ACT Science Score Spring 2016	39293	20.14	20.8	4.844

ACT Score Frequencies

Approximately 8.3% of Utah students earned a composite score of 28 or higher, which falls at the 92nd percentile. Another 41.2% score above the national mean (21). 29.8% score in the bottom quartile with a Composite score of 16 or lower.

Table Three:
Frequencies of ACT Composite Scores

ACT Composite Score Spring 2016				
		Frequency	Valid Percent	Cumulative Percent
Valid	5	1	.0	.0
	6	2	.0	.0
	7	8	.0	.0
	8	6	.0	.0
	9	24	.1	.1
	10	76	.2	.3
	11	322	.8	1.1
	12	1001	2.5	3.7
	13	2029	5.2	8.8
	14	2594	6.6	15.4
	15	2733	7.0	22.4
	16	2925	7.4	29.8
	17	2973	7.6	37.4
	18	2934	7.5	44.9
	19	2801	7.1	52.0
	20	2674	6.8	58.8
	21	2548	6.5	65.3
	22	2368	6.0	71.3
	23	2094	5.3	76.6
	24	1867	4.8	81.4
	25	1599	4.1	85.5
	26	1349	3.4	88.9
	27	1118	2.8	91.7
	28	933	2.4	94.1
	29	711	1.8	95.9
	30	533	1.4	97.3
	31	423	1.1	98.4
	32	290	.7	99.1
	33	190	.5	99.6
	34	113	.3	99.9
	35	41	.1	100.0
	36	8	.0	100.0
	Total	39288	100.0	

Mean ACT Scores Disaggregated by Student Background

This section reports ACT scores disaggregated by race and eligibility for free or reduced lunch. As displayed in Table Four and Figure One, Caucasian/White (20.57), Multiracial (M=20.14) and Asian (M=20.02) students significantly outscore Pacific Islander (M=17.20), Latino/Hispanic (M=16.70), African American/Black (M=16.25), and Native American (M=15.98) students. To put these results in perspective, a Composite score of 20 falls at the 50th percentile nationally, while a Composite score of 17 represents the 31st percentile.

Table Four
Mean ACT Scores by Race/Ethnicity Spring 2016

		Report				
		ACT Composite	ACT English Score	ACT Math	ACT Reading	ACT Science
		Score Spring 2016	Spring 2016	Score Spring 2016	Score Spring 2016	Score Spring 2016
Race 2015-16		Score Spring 2016	Spring 2016	2016	2016	2016
African American/Black	Mean	16.25	14.57	16.18	16.67	17.06
	N	538	541	540	538	539
	Std. Deviation	3.860	5.246	3.157	5.254	3.982
Asian	Mean	20.02	18.65	20.47	19.79	20.61
	N	724	725	725	724	724
	Std. Deviation	5.690	6.922	5.744	6.422	5.571
Caucasian/White	Mean	20.57	19.77	20.24	20.98	20.77
	N	30197	30232	30223	30207	30201
	Std. Deviation	4.922	6.103	4.893	6.043	4.777
Hispanic/Latino	Mean	16.70	15.01	16.78	16.91	17.58
	N	5893	5906	5902	5897	5893
	Std. Deviation	3.958	5.173	3.505	5.190	4.116
Mutiracial	Mean	20.14	19.33	19.74	20.60	20.43
	N	866	867	866	866	866
	Std. Deviation	4.980	6.251	4.828	6.102	4.879
Native American	Mean	15.98	13.85	16.47	16.14	16.96
	N	439	439	439	439	439
	Std. Deviation	3.807	4.905	3.345	5.292	4.037
Pacific Islander	Mean	17.20	15.74	17.36	17.56	17.68
	N	631	632	632	631	631
	Std. Deviation	3.835	5.029	3.693	5.014	3.998

Figure One

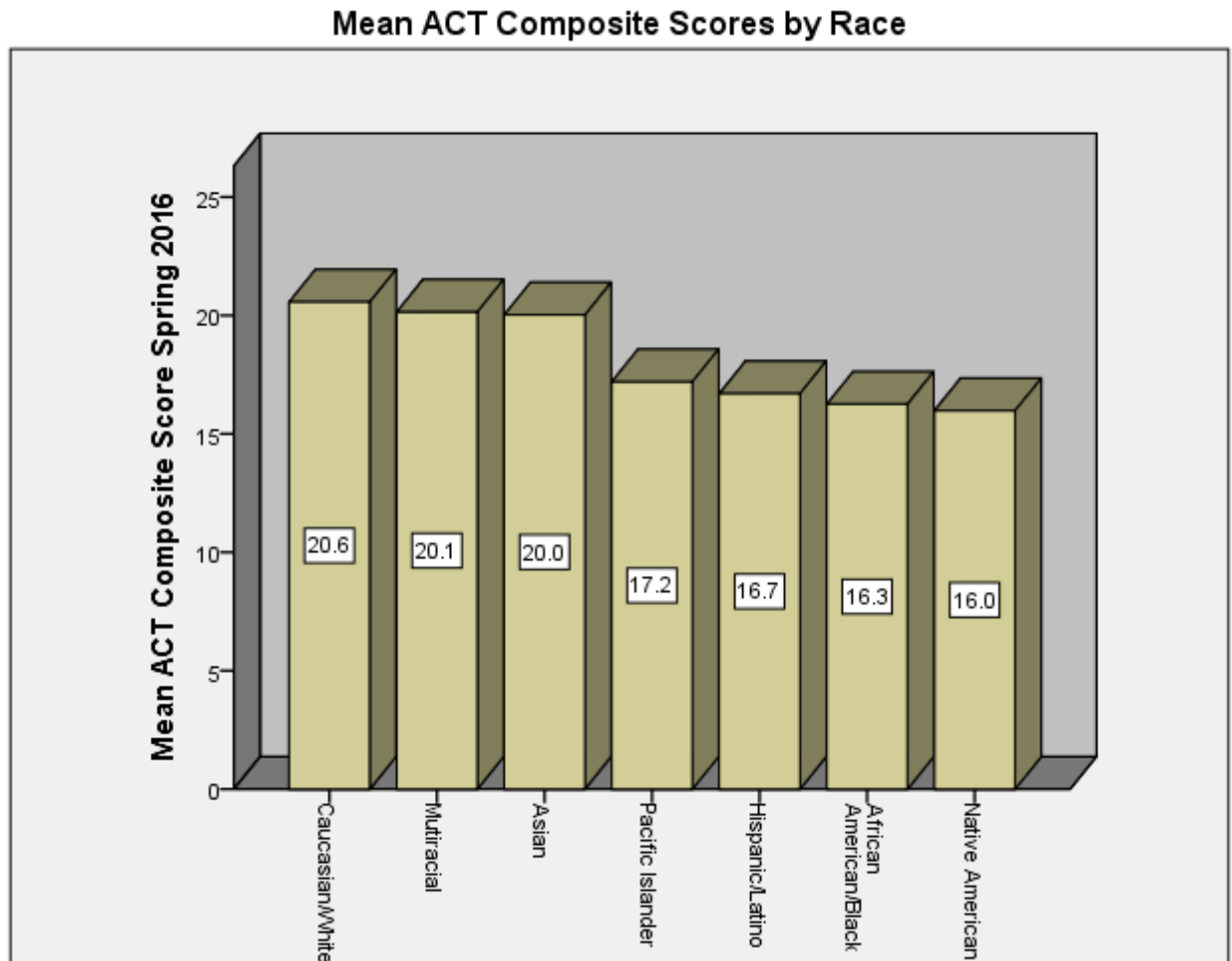


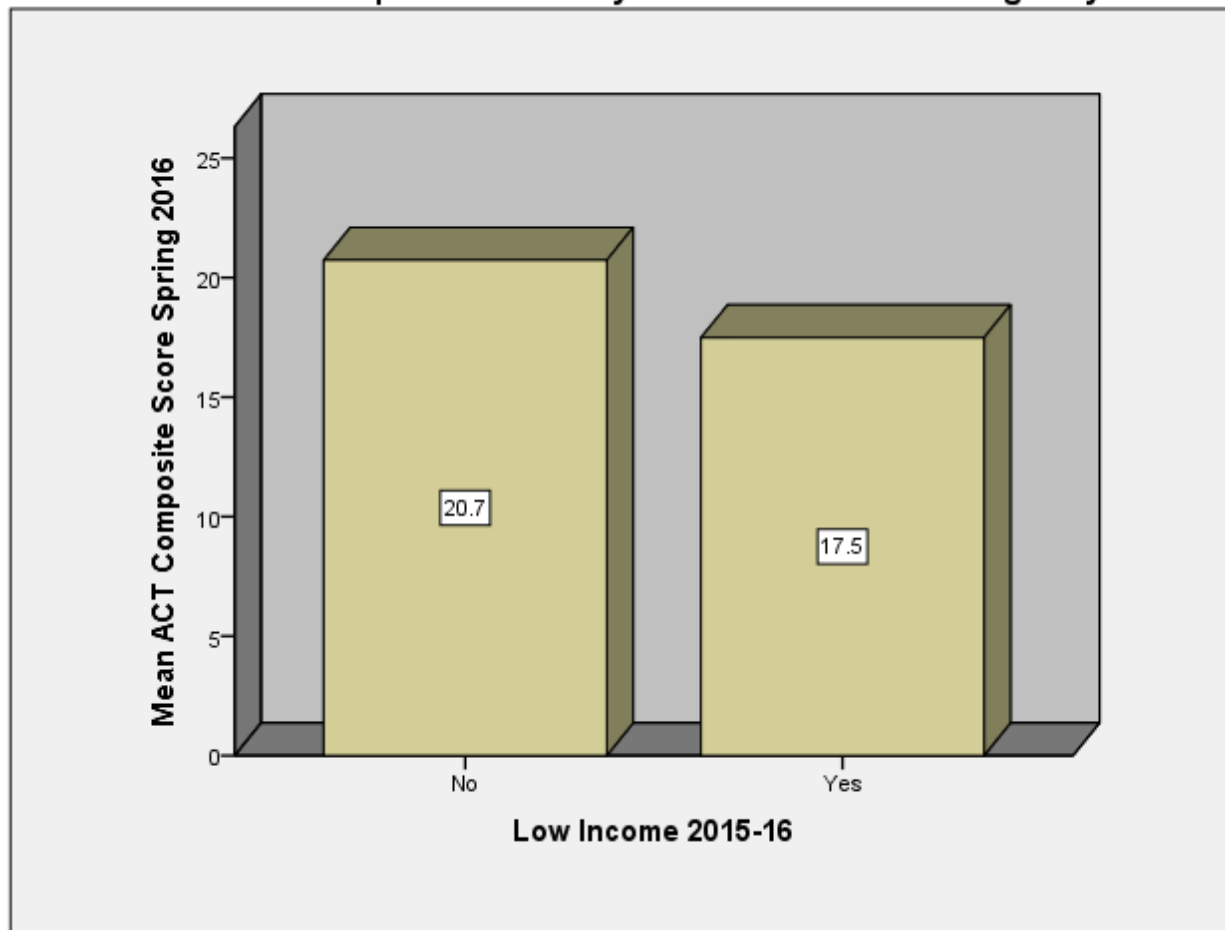
Table Five and Figure Two display mean ACT scores disaggregated by income as measured by eligibility for free or reduced lunch. Students eligible for free or reduced lunch ($M=17.49$) score significantly lower than their higher income peers ($M=20.73$). A Composite score of 18 falls at the 37nd national percentile while a score of 21 represents the 57th national percentile.

Table Five
Mean ACT Scores by Free/Reduced Lunch Eligibility Spring 2016

		Report				
		ACT Composite	ACT English Score Spring	ACT Math Score	ACT Reading	ACT Science Score Spring
Low Income 2015-16		Score Spring 2016	2016	Spring 2016	Score Spring 2016	2016
No	Mean	20.73	19.95	20.41	21.13	20.92
	N	28011	28031	28026	28019	28015
	Std. Deviation	4.954	6.134	4.950	6.055	4.805
Yes	Mean	17.49	16.01	17.48	17.79	18.18
	N	11277	11311	11301	11283	11278
	Std. Deviation	4.340	5.590	3.953	5.572	4.364

Figure Two

Mean ACT Composite Scores by Free/Reduced Lunch Eligibility



Mean ACT Scores Disaggregated by School Variables

This section reports mean ACT scores disaggregated by school characteristics. Specifically, subject area and Composite scores are disaggregated by Utah school accountability grade received. As displayed in Table Six, mean ACT scores declined linearly with Utah school accountability grades. Students attending high schools receiving a grade of A earned a mean Composite score of 22.38, while students served in schools graded F produced a mean Composite score of 17.51. Although the correlation between ACT scores and school accountability grade was significant ($r=.212$), it is relatively small.

Table Six
Mean ACT Scores by School Accountability Grade Spring 2016

		Report				
		ACT Composite	ACT English	ACT Math Score	ACT Reading	ACT Science
Utah School Accountability Grade Earned Spring 2016		Score Spring 2016	Score Spring 2016	Score Spring 2016	Score Spring 2016	Score Spring 2016
F	Mean	17.51	16.32	17.19	17.90	18.14

	N	3525	3534	3530	3526	3526
	Std. Deviation	4.417	5.838	3.871	5.723	4.368
	Mean	18.89	17.85	18.44	19.34	19.42
D	N	3896	3898	3897	3897	3896
	Std. Deviation	4.842	6.119	4.445	6.078	4.726
	Mean	19.74	18.77	19.47	20.12	20.10
C	N	12705	12718	12714	12708	12706
	Std. Deviation	4.900	6.138	4.754	6.022	4.753
	Mean	20.72	19.85	20.53	21.07	20.92
B	N	15816	15827	15825	15820	15818
	Std. Deviation	4.953	6.152	4.939	6.029	4.804
	Mean	22.38	21.34	22.65	22.64	22.34
A	N	1140	1148	1145	1143	1140
	Std. Deviation	4.745	5.859	4.905	5.877	4.590
	Mean	19.94	18.98	19.70	20.31	20.26
Total	N	37082	37125	37111	37094	37086
	Std. Deviation	4.983	6.213	4.871	6.088	4.818
	Mean					

College Readiness

This section of the report focuses on the college readiness levels of 2016 11th grade students tested in Utah public schools. The following explains the methods by which ACT scores are used to determine college readiness.

“The Benchmarks are scores on the ACT subject-area tests that represent the level of achievement required for students to have a 50% chance of obtaining a B or higher or about a 75% chance of obtaining a C or higher in corresponding credit-bearing first-year college courses. These college courses include English composition, college algebra, introductory social science courses, and biology. Based on a sample of 214 institutions and more than 230,000 students from across the United States, the Benchmarks are median course placement values for these institutions and as such represent a *typical* set of expectations.”

<http://www.act.org/solutions/college-career-readiness/college-readiness-benchmarks/>

Table Twenty-Three displays the scores required to be college ready by subject area. For example, a student scoring 18 or higher on the English section of the ACT is considered to be college ready in English and has a 50% chance of earning a B or higher and a 75% chance of obtaining a C or higher in a college English Composition course.

Table Seven
ACT College Ready Benchmarks by Subject Area

College Course	ACT Subject-Area Test	The ACT Benchmark
English Composition	English	18
College Algebra	Mathematics	22
Social Sciences	Reading	22
Biology	Science	23

The percentage of 2016 Utah graduates that are college ready in each subject area is reported in Figure Three. The college readiness levels of these students in English (54.8%) is approximately 1.6 times higher than the levels in Reading (38.1%), Math (32.4%), and Science (31.9%) on average. Nationally, the percentage of students deemed college ready by subject area is English (61%), Reading (44%), Math (41%), and Science (36%).

Figure Three

Percentage of College Ready Students by Subject Area Spring 2016

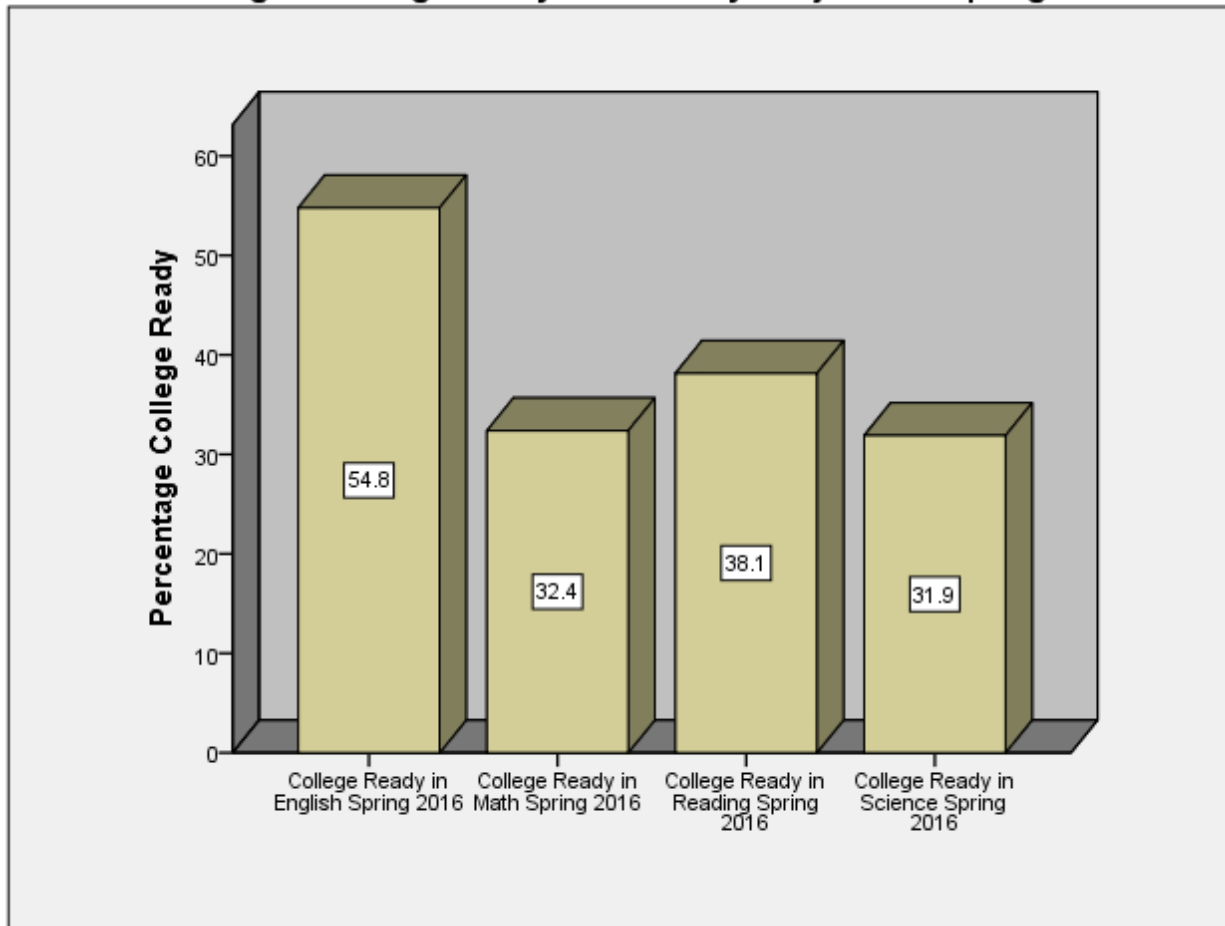
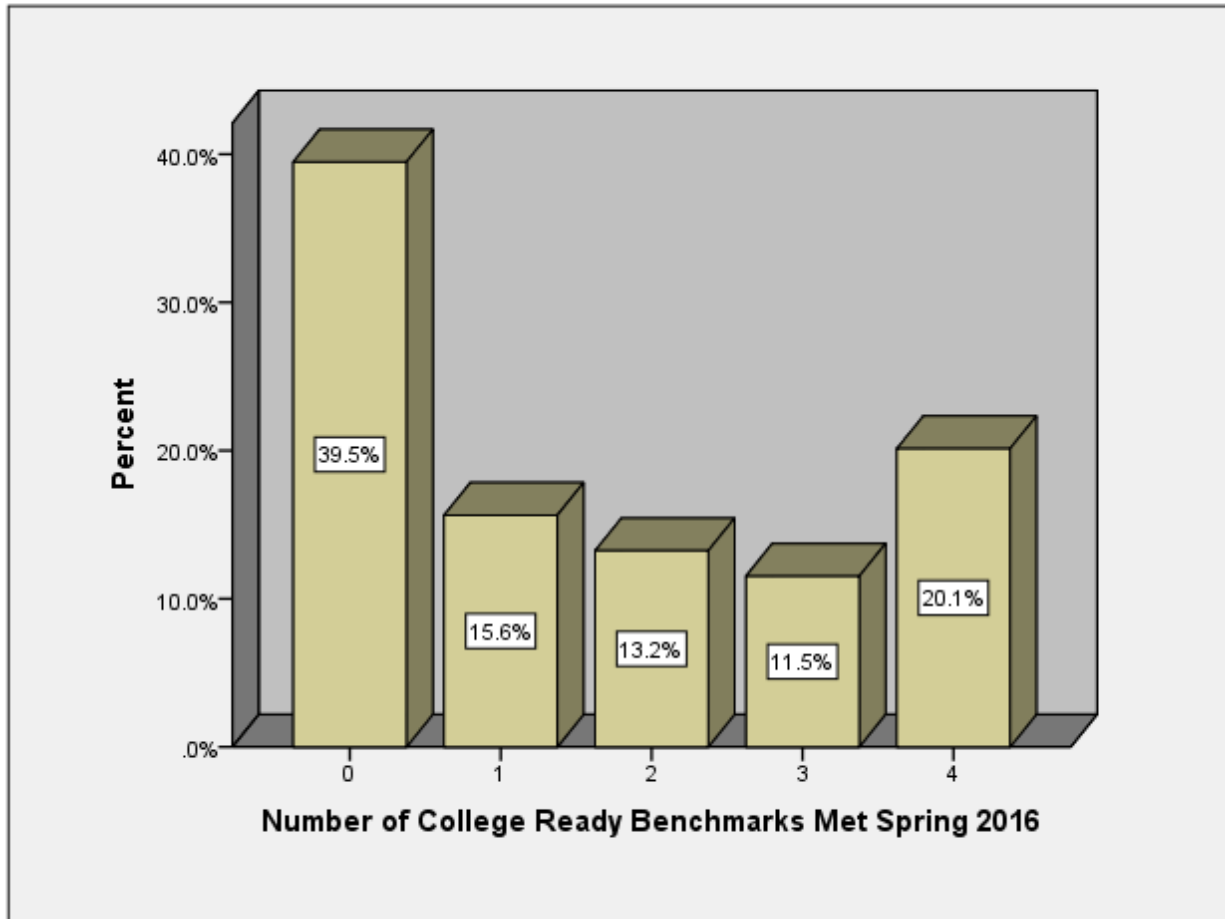


Figure Four displays the percentage of 2016 Utah test takers meeting each possible number of benchmarks. Specifically, 20.1% of Utah graduates in spring 2016 met all four benchmarks (English, Math, Reading and Science), while (39.5%) did not attain benchmark scores for college readiness in any subject areas. Nationally, 26% of students scored college ready in all subject areas.

Figure Four

Number of College Ready Benchmarks Met Spring 2016



College Readiness Disaggregated by Student Background

The percentage of college ready students by race is reported in Table Eight. Consistent with the disaggregated mean scores, Asian, Caucasian/White and Multiracial students are more likely to be college ready in all subject areas than their African-American/Black, Hispanic/Latino, Native American, and Pacific Islander peers. To highlight some of the largest gaps between white and non-white students, Caucasian students (61.3%) are over twice as likely as African American/Black students (26.1%) to be college ready in English and 4.6 times as likely to be college ready in Math. Similarly, Caucasians are 2.89, 3.82, and 3.08 times as likely to be college ready in Science compared to their Hispanic/Latino, Native American, and Pacific Islander counterparts, respectively.

Table Eight
Percentage of 2014 Utah Graduates that are College Ready in Each Subject Area by Race

			English	Math	Reading	Science	Total N
Race/Ethnicity	African	Count	141	44	94	52	541
	American/Black	% within Race/Ethnicity	26.1%	8.1%	17.5%	9.6%	100.0%
	Asian	Count	376	281	265	256	725
		% within Race/Ethnicity	51.9%	38.8%	36.6%	35.4%	100.0%
	Caucasian/Wh.	Count	18542	11318	13090	11074	30232
		% within Race/Ethnicity	61.3%	37.4%	43.3%	36.7%	100.0%
	Hispanic/Latino	Count	1668	656	1020	750	5906
		% within Race/Ethnicity	28.2%	11.1%	17.3%	12.7%	100.0%
	Multiracial	Count	496	294	338	279	867
		% within Race/Ethnicity	57.2%	33.9%	39.0%	32.2%	100.0%
	Native American	Count	94	39	60	42	439
		% within Race/Ethnicity	21.4%	8.9%	13.7%	9.6%	100.0%
	Pacific Islander	Count	211	93	123	75	632
		% within Race/Ethnicity	33.4%	14.7%	19.5%	11.9%	100.0%
	Total	Count	21528	12725	14990	12528	39342
		% within Race/Ethnicity	67.0%	32.4%	38.1%	31.9%	100.0%

Table Nine reports the percentage of students meeting each possible number of benchmarks by race. Between 60 and 75% of Native American (74.7%), African-American (70.3%), Hispanic/Latino (66.6%), and Pacific Islander (59.9%) students fail to meet college readiness benchmarks in any subject area. Similarly, the percentage of these students meeting all four benchmarks only ranges from 4.1% (Native Americans) to 5.9% (Hispanic/Latinos). In contrast, Asian (23.3%) and Caucasian (23.6%) students are over five times as likely as Native American students to attain college readiness scores in all four subject areas.

Table Nine
Number of College Ready Benchmarks Attained by Race

Race 2015-16 * Number of College Ready Benchmarks Met Spring 2016 Crosstabulation

			Number of College Ready Benchmarks Met Spring 2016				
			0	1	2	3	4
Race 2015-16	African American/Black	Count	378	63	49	22	26
		% within Race 2015-16	70.3%	11.7%	9.1%	4.1%	4.8%
	Asian	Count	299	101	64	91	169
		% within Race 2015-16	41.3%	14.0%	8.8%	12.6%	23.3%
	Caucasian/White	Count	9889	4819	4415	3935	7139
		% within Race 2015-16	32.7%	16.0%	14.6%	13.0%	23.6%
	Hispanic/Latino	Count	3926	839	474	309	345
		% within Race 2015-16	66.6%	14.2%	8.0%	5.2%	5.9%
	Mutiracial	Count	310	160	116	105	175
		% within Race 2015-16	35.8%	18.5%	13.4%	12.1%	20.2%
	Native American	Count	328	46	24	23	18
		% within Race 2015-16	74.7%	10.5%	5.5%	5.2%	4.1%
	Pacific Islander	Count	378	117	60	41	35
		% within Race 2015-16	59.9%	18.5%	9.5%	6.5%	5.5%

Correlations of the ACT with SAGE

Tables 10-12 report the correlations of the ACT with SAGE scores by content area. Correlations of .70 or greater are considered to be strong, positive correlations. All correlations between ACT and SAGE exceed .70. This indicates that students who score high on SAGE also score high on the ACT. Both assessments rank students by scores in a similar order. High correlations do not assure that the two assessments measure the same knowledge and skills.

Table 10:
Correlations Grade 11 Spring 2016 ACT and SAGE Math

		Correlations	
		ACT Math Score Spring 2016	SAGE Math Scale Score Spring 2016
ACT Math Score Spring 2016	Pearson Correlation	1	.821**
	Sig. (2-tailed)		.000
	N	39327	38019
SAGE Math Scale Score Spring 2016	Pearson Correlation	.821**	1
	Sig. (2-tailed)	.000	
	N	38019	43561

** . Correlation is significant at the 0.01 level (2-tailed).

Table 11
Correlations Grade 11 Spring 2016 ACT Reading and English with SAGE ELA

		Correlations		
		ACT English Score Spring 2016	ACT Reading Score Spring 2016	SAGE Language Arts Scale Score Spring 2016
ACT English Score Spring 2016	Pearson Correlation	1	.817**	.803**
	Sig. (2-tailed)		.000	.000
	N	39342	39299	38666
ACT Reading Score Spring 2016	Pearson Correlation	.817**	1	.756**
	Sig. (2-tailed)	.000		.000
	N	39299	39302	38630
SAGE Language Arts Scale Score Spring 2016	Pearson Correlation	.803**	.756**	1
	Sig. (2-tailed)	.000	.000	
	N	38666	38630	44356

** . Correlation is significant at the 0.01 level (2-tailed).

Table 12
Correlations Grade 11 Spring 2016 ACT and SAGE Science

		Correlations	
		ACT Science Score Spring 2016	SAGE Science Scale Score Spring 2016
ACT Science Score Spring 2016	Pearson Correlation	1	.708**
	Sig. (2-tailed)		.000
	N	39293	38141
SAGE Science Scale Score Spring 2016	Pearson Correlation	.708**	1
	Sig. (2-tailed)	.000	
	N	38141	43721

** . Correlation is significant at the 0.01 level (2-tailed).

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